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filaments of the latter being uniform in their size, and pursuing individually one unvarying course, in lines parallel to each other. The fibres of the heart appear to possess a somewhat compound character of texture. The muscles of the pharynx exhibit the character of animal life; while those of the œsophagus, the stomach, the intestines, and the arterial system, possess that of inorganic life. The determination of the exact nature of the muscular fibres of the iris presented considerable difficulties, which the author has not yet been able satisfactorily to overcome.

A paper was also in part read, entitled, "On the Function of the Medulla Oblongata and Medulla Spinalis, and on the Excito-motory System of Nerves." By Marshall Hall, M.D., F.R.S. L. and E., &c.

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February 23, 1837.

The Right Honourable the EARL OF BURLINGTON, V.P., in the Chair.

Richard Partridge, Esq., was elected a Fellow of the Society.

The reading of Dr. Marshall Hall's paper was resumed, but not concluded.

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March 2, 1837.

WILLIAM LAWRENCE, Esq., V.P., in the Chair.

The reading of a paper, entitled, "On the Function of the Medulla Oblongata and Medulla Spinalis, and on the Excito-motory System of Nerves." By Marshall Hall, M.D., F.R.S., L. and E., &c., was resumed and concluded.

The author begins by observing that a former memoir of his, entitled, "On the Reflex Function of the Medulla Oblongata and Medulla Spinalis," published in the Philosophical Transactions for 1833, has been translated into German, and favourably spoken of by Professor Muller, of Berlin. He states that his object in the present paper is to unfold what he calls a great principle in physiology; namely, that of the special function, and the physiological and pathological action and reactions of the true spinal marrow, and of the excito-motory nerves. The two experiments which he regards as affording the type of those physiological phenomena and pathological conditions, which are the direct effects of causes acting in the spinal marrow, or in the course of the motor nerves, are the following:—1. If a muscular nerve be stimulated, either mechanically by the forceps, or by means of galvanism passed transversely across its fibres, the muscle or muscles to which it is distributed are excited to contract.—2. The same result is obtained when the spinal marrow itself is subjected to the agency of a mechanical or galvanic stimulus. The following experiment, on the other hand, presents the type of all the actions of the reflex func-

tion of the spinal marrow, and of the excito-motory system of nerves, and of an exclusive series of physiological and pathological phenomena :—If in a turtle, from which the head and sternum have been removed, we lay bare the sixth or seventh intercostal nerve, and stimulate it either by means of the forceps or galvanism, both the anterior and posterior fins, with the tail, are immediately moved with energy. Hence the author infers the existence : 1st, of a true spinal marrow, physiologically distinct from the chord of intra-spinal nerves ; 2ndly, of a system of excito-motory nerves, physiologically distinct from the sentient and voluntary nerves ; and, 3rdly, of currents of nervous influence, incident, upwards, downwards, and reflex with regard to the spinal marrow.

A review is then taken of the labours of preceding physiologists relative to the functions of the nervous system : in which the author criticises the reasonings of Whytt, Legallois, Mr. Mayo, Dr. Alison, and Professor Muller ; and illustrates his own peculiar views by several experiments and pathological observations, which appear to him to show that muscular movements may occur, under circumstances implying the cessation of sensation, volition, and every other function of the brain ; and that these phenomena are explicable only on the hypothesis that impressions made on a certain set of nerves, which he terms *excito-motory*, are conveyed to a particular portion of the spinal marrow belonging to that system, and are thence reflected, by means of certain motor nerves, upon certain sets of muscles, inducing certain actions. The same actions may also be the result of impressions made directly either on the spinal marrow or on the motor nerves. He accordingly considers that the whole nervous system may be divided into,—1st, the *cerebral*, or the sentient and voluntary ; 2ndly, the *true spinal*, or the excitor and motor ; and, 3rdly, the *ganglionic*, or the nutrient, the secretory, &c. The excito-motory system presides over ingestion and exclusion, retention and egestion, and over the orifices and sphincters of the animal frame : it is therefore the nervous system of respiration, deglutition, &c., and the source of tone in the whole muscular system. The true spinal system is the seat or nervous agent of the appetites and passions, but is also susceptible of modification by volition. This theory he proceeds to apply to the explanation of several phenomena relating to the motions of the eyelids, pharynx, cardia, larynx, muscles of inspiration, sphincter ani, expulsors of the fæces and semen, to the tone of the muscular system generally, and to actions resulting from the passions. Lastly, he considers its application to various diseased states of the same functions, as manifested in cynic spasm, vomiting, asthma, tenesmus, strangury, crowing inspiration, convulsions, epilepsy, tetanus, hydrophobia, and paralysis.

Reference is made, in the course of the paper, to several drawings and diagrams, which, however, have not yet been supplied.